

A REVIEW OF THE GENUS *LIODEMA* HORN (COLEOPTERA:
TENEBRIONIDAE) WITH DESCRIPTION OF A NEW SPECIES FROM
COSTA RICA AND PANAMA

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Abstract.—The five species of the New World genus *Liodema* are reviewed. A new species, *L. explanatum* is described from Costa Rica and Panama. The following synonymy is recorded: *L. quadrinotatum* (Laporte and Brullé), *L. kirschi* Bates, *L. obydense* Bates, **n. syn.**, *L. fulvum* Bates, *L. horni* Bates, **n. syn.**, *L. proximum* (Chevrolat), *L. tergocinctum* (Chevrolat), and *L. inscriptum* (Chevrolat), are all synonyms of *L. maculatum* (Fabricius); *L. cruciatum* (Chevrolat), *L. hamatiferum* (Chevrolat), **n. syn.**, *L. ramulosum* (Chevrolat), **n. syn.**, *L. zimmermani* Champion, **n. syn.**, and *L. flavo-variegatum* Champion, **n. syn.**, are all synonyms of *L. serricorne* Bates. *Liodema irradians* (Chevrolat) is transferred to *Platydema* **n. comb.** and *L. tenuicorne* (Chevrolat) is transferred to Crypticini (Tenebrionidae), **n. comb.**

Key Words: Darkling beetles, Tenebrionidae, *Liodema*

The genus *Liodema* was described by Horn (1870:385) to receive *Platydema laeve* Haldeman (1848:101) from North Carolina, which is the type by monotypy. Members of *Liodema* closely resemble species of the large genus *Platydema* Laporte and Brullé but differ in having the mesosternum prolonged cephalad as a prominent, blunt lobe which conceals the prosternal process.

The only other genus with such a peculiar modification of the mesosternum is *Stenoscapa* (Bates 1873:237) with two described species from Brazil and Mexico. In *Stenoscapa* the tibiae are all armed with conspicuous apical spurs (they are very short in *Liodema*).

According to Gebien (1940:417), *Liodema* contains twelve species, all of which are New World in distribution. I have been assembling specimens for several decades in anticipation of a generic revision. Having

seen most of the existing types and having studied specimens from major collections around the world, I feel compelled to report my understanding of the genus to date.

I believe there is much more variation in size and color pattern than previous workers supposed. It is interesting that Bates (1873) described six species, five of which were each described from a single specimen. The study of intraspecific variation was difficult because so few series of specimens from a single locality and date were available. Also, the genitalia did not prove helpful in separating species.

SPECIES EXCLUDED FROM *LIODEMA*

Scaphidema irradians Chevrolat 1877a:178
(type locality: Cayenne.)

I have been unable to determine who transferred this species to *Liodema*. It is so placed in Gebien's catalogs and in that of Blackwelder (1945:529). I examined the

type in MNHN in 1980 and again in 1987. The type is a unique from Cayenne and belongs to the genus *Platydemia*, **new comb.**

Platydemia tenuicorne: Chevrolat 1877b: 182. (type locality: Caracas, Venezuela.)

Liodema tenuicorne: Chevrolat 1878a:243 (generic transfer).

I studied the unique type of this species in MNHN in 1980 and determined it to be a crypticine, and indicated in my notes its similarity to *Gouwanocrypticus obsoletus* (Say). It is badly mounted so that the mesosternum is not clearly visible. It is definitely not a *Liodema*, but I am not certain of its generic placement.

KEY TO SPECIES OF *LIODEMA*

1. Elytra uniformly dark brown or piceous *L. laeve* (Haldeman)
- Elytra with reddish or yellowish and black markings. 2
2. Elytra and pronotum with lateral margins distinctly explanate; pronotum uniformly dark (Fig. 1) *L. explanatum*, new species
- Elytra and pronotum with lateral margins narrow, scarcely visible from above; pronotal coloration variable 3
3. Elytra with black markings, mostly lateral, usually not attaining suture *L. connexum* Bates
- Elytra with dark markings usually extending along suture 4
4. Elytra mostly black with a basal and apical crescent-shaped reddish or yellowish mark; pronotum usually uniformly black *L. maculatum* (Fabricius)
- Elytra mostly yellowish or reddish with an oblique, irregular median black band, a sub-apical one, and a basal band with 3 or 4 finger like extensions; pronotum usually with black central markings on a light background *L. serricornis* Bates

Liodema laeve (Haldeman)

Platydemia laevis Haldeman 1848:101 (type locality: North Carolina, in MCZC, type No. 8372).

Liodema laeve: Horn 1870:385; Champion 1886:205; Triplehorn 1965:436.

This species is unicolorous dark brown or piceous, totally lacking reddish or yellowish bands or spots which characterize

the others. Measurements: Length 3.7–4.4 mm; width: 2.4–2.5 mm.

Distribution.—This is the only species occurring in the United States (Florida, Georgia, Mississippi, North Carolina, and Texas). It also occurs in Costa Rica (Turrialba, Puntarenas; Santa Cecilia, Guanacaste), Mexico (Querétaro, Tamaulipas, Veracruz), and Panama (Chiriquí Province). A total of 37 specimens was studied; it remains relatively rare in collections and the largest series studied consists of three specimens.

Liodema explanatum Triplehorn, new species (Fig. 1)

Description.—Holotype, sex undetermined: Elongate-oval, moderately convex, dark brown with reddish-brown elytral maculations, slightly shining. Head flat, reddish brown, becoming darker posteriorly, clypeus large, well-defined, anterior margin truncate, finely and obsoletely punctate, frons flat, punctate as clypeus, eye reniform, dorsal lobe narrow and much smaller than ventral lobe, eyes separated ventrally by almost three times the diameter of one eye; antenna uniformly light reddish brown. Pronotum twice as broad as long, somewhat trapezoidal, basal margin about twice width of apical margin, apical margin truncate, angles obtusely rounded, basal margin strongly bisinuate, angles acute, lateral margins almost straight, rapidly converging from base to apex, distinctly explanate in basal half, surface punctation as on head. Elytron with lateral margin slightly arcuate, narrowly but conspicuously and uniformly explanate from base to apex, finely punctate-striate, punctures shallowly impressed and not in grooves, two large, light reddish-brown blotches on each elytron, one in basal third not quite reaching base, suture nor lateral margins, one in apical third, smaller and transverse, attaining lateral margin but not suture. Ventral surface shiny, minutely and obsoletely punctate, legs, antenna, mouthparts, and epipleuron concolorous



Fig. 1. *Liodema explanatum*. Actual length, 5.0 mm.

with ventral surface. (Length: 5.1 mm; width: 3.0 mm.)

Variation.—I am unable to distinguish between the sexes without dissection. The coloration is rather uniform, but sometimes the basal reddish blotch does attain the basal margin. Measurements (46 specimens): Length: 4.3–5.4 mm.; width: 2.8–3.3 mm.

Discussion.—This species is easily distinguished from all other *Liodema* by the explanate lateral margins of the elytra and basal half of the pronotal margins. It is also the least convex species of the genus. The elytral color pattern is similar to that of *L. maculatum*, but the basal reddish blotch is much larger.

Types.—Holotype, sex undetermined: Costa Rica, Puntarenas, Monteverde area, 6–14 June 1973, 1400–1700 m, Erwin and Hevel Central American Expedition, 1973. Paratypes: same data, 14; Costa Rica, Puntarenas, Monteverde, V-26-VI-3, 1984, E. Riley, D. Rider, D. LeDoux, 9; Costa Rica, Coronado, 1400–1500 m, 22-IV-28, 15-VIII-31, Neverman, 3; Costa Rica, Neverman Collection; Costa Rica, Guanacaste, Estac. Cacao, sw side Volcano Cacao, 1000–1400 m, IX-XII, 1989, URG, R. Blanco + C. Chavez, 20; same data except VI-1990, no collectors listed, 5; Costa Rica, Puntarenas, Fca. Cafrosa, Est. Las Mellizas, P. N. Amistad, 1300 m, XI-1989, M. Ramirez + M. Mora, 1; Costa Rica, Cartago Prov., Pejibaye, 22-III-1987, W. E. Steiner, 1; Panama, Cocle Prov., El Valle, 829 m, 26/27-V-1983, W. E. Steiner, 14; Panama, Chiriquí Prov., 2 km N. Sta. Clara, Hartmann's Finca, 1300 m, 8°51'N, 82°36'W, 24/25-V-1977, H. + A. Howden, 1. Holotype and paratypes in USNM; paratypes in CNCI, LSUC, OSUC, and INBC.

Liodema connexum Bates

Liodema connexum Bates 1873:236 (type locality: Colombia; type in BMNH).

Platydemus nigro-fasciatus Chevrolat 1878a:215 (type locality: Mexico; type in MNHN).

Liodema nigro-fasciatus: Chevrolat 1878a:

243 (generic transfer); Champion 1886:207 (as synonym of *L. connexum*).

In this species, the elytra are predominantly (sometimes entirely) reddish with a basal humeral black blotch connected narrowly along the margin with an irregular median band which does not attain the suture. Measurements: Length: 2.8–5.2 mm.; width: 2.5–3.1 mm.

I do not agree with Champion in regarding *L. cruciatum* (Chevrolat) as a variety of *L. connexum*. I believe it to be a synonym of *L. serricornis* and have so treated it under that name.

Distribution.—I have seen only 33 specimens I consider to be this species. Since it is so rare in collections, I have recorded the data as follows: Costa Rica (Puntarenas, Monteverde; Hamburg Farm, Reventazon, Ebene Limon); Colombia (Pichindé); Ecuador (Santo Domingo); Panama (Chiriquí Province, Panama Province; Boca del Toro); Peru (Sinchona; Tarma Province; 15 km SE Moyabamba).

Liodema maculatum (Fabricius)

Mycetophagus maculatus Fabricius 1801:556 (type locality: Essequibo, Guyana; not seen).

Platydemus quadrinotatus Laporte and Brullé 1831:380 (type locality: Colombia, not seen); Chevrolat 1878a:243 (transferred to *Liodema*); Champion 1886:205 (listed as a probable synonym of *L. kirschi*.)

Liodema kirschi Bates 1873:235 (type locality: Bogota, Colombia; type in BMNH); Champion 1886:205, pl. 9, fig. 13; Gebien 1940:417 (as synonym of *L. maculatum*)

Liodema obydensis Bates 1873:235 (type locality: Obydos, Brazil; type in BMNH) Champion 1886:206. **New synonymy.**

Liodema fulvum Bates 1873:236 (type locality: Cumana, Venezuela; type in BMNH); Champion 1886:205 (as synonym of *L. kirschi*).

Liodema horni Bates 1873:236 (type local-

ity: Santarem, Brazil; type in BMNH).

New synonymy.

Scaphidema proximum Chevrolat 1877a: 178 (type locality: Mexico; type in MNHN).

Scaphisoma (sic) *proximum*: Bates, Chevrolat, 1878a:243 (synonym of *Liodea obidense* (sic)).

Scaphidema tergocinctum Chevrolat 1877a: 178 (type locality: Guatemala; type in MNHN).

Scaphisoma (sic) *tergocinctum*: Chevrolat 1878a:243 (synonym of *Liodea kirschii* Bates).

Liodea inscriptum Chevrolat 1878a:222 (type locality: Cordoba, Mexico; type not seen); Champion 1886:205 (as synonym of *L. kirschii*).

Liodea maculatum: Gebien 1906:219.

This species is quite variable in both size and coloration. The dorsum is typically dull black with two reddish maculae on each elytron, one a crescent-shaped band curving caudad from the base at the scutellum to the humeri (but not reaching the lateral margin), the other an apical large reddish blotch extending to the sides, apex, and sometimes the suture, with an oblique black spot at its center.

Often, the apical red blotch appears to be a crescent-shaped band curving cephalad, just the opposite of the basal band. The greatest variation is in the amount of red forming the bands.

Measurements (100+ specimens).—Length: 3.3–6.5 mm; width: 2.0–3.6 mm.

Distribution.—Specimens (more than 350) were examined from the following countries: Argentina, Belize, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad, Uruguay, Venezuela.

The species ranges from Mexico (states of Tamaulipas, San Luis Potosi, and Nayarit) south to Argentina (Rio Paraná). It is the only species of *Liodea* which may be considered at all common and the only one

in which large series (25–35 specimens) are available for study.

Liodea serricorne Bates

Liodea serricorne Bates 1873:236 (type locality: Cayenne; type in BMNH); Champion 1886:207, pl. 9, fig. 17.

Platydemus cruciatus Chevrolat 1877b:182 (type locality: Bogota, Colombia; type in MNHN).

Scaphidema cruciatus: Chevrolat 1877c: 187 (synonymy).

Liodea cruciatus: Chevrolat 1878a:243; Champion 1886:207, pl. 9, fig. 16 (as variety of *L. connexum*).

Platydemus hamatiferus Chevrolat 1878b:C (type locality: Petropolis, Brazil; type in MNHN). **New synonymy.**

Platydemus ramulosus Chevrolat 1878b:C (type locality: Petropolis, Brazil; type in MNHN). **New synonymy.**

Liodea zimmermani Champion 1886:206, pl. 9, fig. 14 (type locality: Pantaleon, Guatemala; type in BMNH). **New synonymy.**

Liodea flavo-variegatum Champion 1886: 208, pl. 9, fig. 18 (type locality: Bugaba, Panama; type in BMNH). **New synonymy.**

Typically, the color pattern of this variable species consists of three or four dark streaks extending caudally from the base of the elytra, an oblique transverse band extending from the lateral margin, uniting at the suture, and extending forward to the base and caudally where it sometimes joins a thinner transverse band which does not extend to the lateral margin; the pronotum is usually yellowish brown with a dark central blotch and two outward-facing crescent-shaped dark markings.

There are many variations of this color pattern, mostly in the relative extent of the dark markings on both pronotum and elytra. In extreme cases the elytra are very dark and the pattern approaches that of *L. maculatum*; the pronotum may be almost com-

pletely dark. No geographic difference in color patterns is evident.

A series of 49 specimens from Bolivia (Beni, 40 km E. San Borja, Estacion Biologica Beni, Palm Camp at Rio Curiraba, 9–15 Sept., 1987, W. E. Steiner, on bark of cut trees at night; inundation forest) is remarkable in the uniformity of the color pattern and the size of the individuals. The finger like lobes of dark coloration are not as distinctly separated as in the typical form, the entire apex of the elytra is uniformly reddish, and the pronotum is mostly dark with light margins. It is very similar to Champion's illustration of *L. cruciatum* (see above synonymy). I have seen this same color pattern in other specimens from various places.

Measurements (87 specimens).—Length: 2.9–5.4 mm.; width 1.7–3.0 mm.

Distribution.—Specimens (112) were examined from the following countries: Argentina, Belize, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, Suriname, Trinidad, Venezuela. This species ranges from Tampico, Tamaulipas, Mexico to Argentine (Desecho Chico).

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